

grounds for rejection at least for the reasons solicited hereinbelow.

The claimed invention is directed generally to a semiconductor memory device including, *inter alia*, a memory cell capacitor for storing data thereon, the memory cell capacitor comprising a first or lower electrode connected to a contact plug, the first electrode including a first barrier film in contact with the contact plug and second and third barrier films formed on the first barrier film for preventing the diffusion of oxygen, and a second or upper electrode. In accordance with the claimed invention, the second and third barrier films cover the upper and side faces of the first barrier film.

It should be noted that in formulating a rejection under 35 USC §103, the examiner must conduct the following four-level factual inquiry: (1) determine the scope and content of the prior art; (2) ascertain differences between the claimed invention and the prior art; (3) resolve the level of ordinary skill in the pertinent art; and (4) evaluate objective evidence of non-obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). In essence, to establish a *prima facie* case of obviousness, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 USPQ 580 (CCPA 1974).

Applicant respectfully contends that the ***Onishi*** patent, either alone or in combination with the ***Jiang*** patent, fails to expressly teach or inherently suggest all the limitations of the claimed invention necessary to support a *prima facie* case of obviousness. For example, the Examiner finds that the ***Onishi*** patent allegedly discloses “a lower capacitor electrode that includes a first and second barrier layer.” The ***Jiang*** patent is relied upon to modify the teachings of the ***Onishi*** patent since it allegedly discloses “first and second barrier films formed over the contact plug (46), and where the barrier films are specifically designed to prevent unwanted oxygen diffusion.” The ***Jiang*** patent, however, fails to disclose a first electrode including a first barrier film in contact with the contact plug and second and third barrier films formed on the first barrier film

for preventing the diffusion of oxygen, whereby the second and third barrier films completely cover the upper and side faces of the first barrier film that is in contact with the contact plug. Accordingly, the **Jiang** patent fails to modify the **Ohnishi** patent in a manner that renders the claimed invention obvious.

Moreover, Applicant further contends that there is a lack of suggestion in either of the **Onishi** or **Jiang** patents to combine their respective teachings in such a manner that would render the claimed invention obvious. In order to render an invention *prima facie*, there must be some teaching, suggestion, or motivation to combine or modify the teachings of the prior art to produce the claimed invention, found either in the references themselves or in the knowledge generally available to a skilled artisan. *In re Fine*, 837 F.2d 1071, 5 USPQ.2d 1596 (Fed. Cir. 1988). The Examiner finds that the teachings of the **Onishi** patent may be combined with the teachings of the or **Jiang** patent in spite of any suggestion in either of the references for making the combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection.

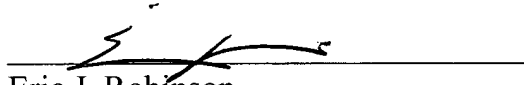
Moreover, Applicant respectfully contends that the semiconductor memory device in accordance with the claimed invention imparts non-obvious advantageous features over the prior art. For example, the present inventors have found that in conventional semiconductor memory devices, the contact plug fails to establish good contact with the lower electrode of the memory cell capacitor as a result of oxidation of the contact plug.

In response to this problem, Applicant has proposed providing the first electrode with a first barrier film in contact with the contact plug and second and third barrier films formed on the first barrier film for preventing the diffusion of oxygen from the contact plug. Accordingly, where the capacitive insulating film is formed by oxidation, the diffusion of oxygen into the first barrier film, and thus, the first electrode, can be suppressed. This results in the prevention of degradation of the contact plug, and thus,

also prevents contact failure between the first electrode and the contact plug. Since the proposed *Ohnishi-Jiang* modification fails to expressly disclose or inherently suggest each limitation of the claimed invention, such non-obvious advantageous properties cannot result by combining their respective teachings.

Accordingly, Applicant respectfully contends that the claimed invention defines subject matter that is patentably distinct over the prior art of record, and thus, it is respectfully requested that the rejection be reconsidered and withdrawn. If the Examiner believes further discussions with Applicants' representative would be beneficial in this case, he is invited to contact the undersigned.

Respectfully submitted,



Eric J. Robinson  
Reg. No. 38,285

NIXON PEABODY LLP  
8180 Greensboro Drive, Suite 800  
McLean, Virginia 22102  
(703) 790-9110

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